

Applications of Evolutionary Psychology in Marketing

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ABSTRACT

Evolutionary psychology is an emerging paradigm in psychological science. The current article introduces this framework to marketing scholars and presents evidence for its increasing acceptance within the social science community. As a result, a case is made for the application of evolutionary psychology to marketing, and especially consumer behavior. Application of the evolutionary framework in studying gender-related consumption behavior is illustrated by comparing the evolutionary predictions with results obtained from previous studies, by supporting these predictions with market-level consumption data, and by proposing new hypotheses based on this framework. Also discussed are the potential applications of evolutionary psychology to other consumption-related phenomena like evaluation of endorser attractiveness in advertising, biologically driven consumption choices among women, consumer-experienced emotions in service encounters, and consumption choices as inclusive fitness maximization rather than utility maximization.

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Most of the issues that vex humanity daily . . . cannot be solved without integrating knowledge from the natural sciences with that of the social sciences and humanities. Only fluency across boundaries will provide a clear view of the world as it really is. (E. O. Wilson, 1998, p. 13)

Evolutionary psychology is an emerging paradigm that seeks to unify the fields of evolutionary biology and cognitive psychology, as applied to the human condition. In doing so it aims to bring together all the branches of psychology under one organized system of knowledge. Moreover, it also has the potential to be a causal link between natural and social sciences in the sense of explaining the phenomena of culture by its biological underpinnings, with psychology as the intermediate link. Given the paradigmatic influence that evolutionary psychology seeks to bring about, it is imperative for other disciplines studying human behavior to be aware of its propositions and potential applicability. The present article seeks to address these very issues so as to apprise marketing scholars of the theoretical concepts underlying evolutionary psychology and suggest some of its potential applications in the field of marketing. The article is organized into three broad sections. The first section introduces the discipline of evolutionary psychology and gives a brief description of its basic theoretical concepts. The second section looks at the growth and acceptance of evolutionary psychology in various natural and social science disciplines. It also identifies an evident neglect of the paradigm in the marketing literature, even though the paradigm has generated sufficient research interest in other areas of management and social sciences. Finally, the last section provides some specific research ideas based on the potential applications of evolutionary psychology to consumer behavior and marketing. Given that a large part of marketing is devoted to studying consumer behavior, which is a subset of human behavior in general, it is proposed that evolutionary psychology is a valid and useful theoretical framework to adopt in this context.

EVOLUTIONARY PSYCHOLOGY: THEORIES AND DOMAINS

Evolutionary psychology seeks to address the following basic question: "How does a particular behavior, cognition, emotion and/or perception constitute a functional solution to an adaptive problem in our evolutionary past?" In contrast to the traditional psychological paradigm, the emphasis in evolutionary psychology is on the *ultimate* rather than *proximate* explanations. That is, evolutionary psychology also tries to answer the question as to why a particular behavior, cognition, or emotion exists, rather than only answering how it operates and what it results in, given that it exists. In attempting to answer this question evolutionary psychology relies on the basic tenet that the human mind is a result of an evolutionary process that operates on the principle of natural selection (Barkow, Cosmides, & Tooby, 1992). The principle of natural selection, as proposed by Darwin (1859), is a three-step process of variation, inheritance, and selection. The human mind is said to be a result of this process and, akin to the eye or the heart, evolved to solve

particular adaptive problems¹ that our ancestors faced during evolutionary history. The mind is said to be composed of a finite number of domain-specific psychological mechanisms that solve specific adaptive problems (Cosmides & Tooby, 1987). These psychological mechanisms can be understood as functional organs of computation that solve problems specific to different domains like perception, reasoning, emotion, and social relations (Pinker, 1997). This view of the human mind is contrary to the traditional view in cognitive psychology that proposes a domain-general architecture for the human mind. See Cosmides and Tooby (1987) for a detailed argument for a domain-specific rather than a domain-general architecture of the human mind. Also, see Pinker (1997) for a detailed account of how the mind is designed by natural selection to perform computations specific to different domains.

Evolutionary psychologists have identified a number of psychological mechanisms that are part of the human mind and qualify as being adaptations. Although each of the mechanisms is known to perform specific functions, the underlying goal of all these mechanisms is to maximize the inclusive fitness of the organism. The concept of inclusive fitness, as proposed by Hamilton (1964), is an extension of Darwin's criteria of natural selection of designs based on maximizing reproductive success. Reproductive success, as referred to by Darwin, measures fitness in terms of number of offspring of a particular individual.² In contrast, inclusive fitness measures reproductive success both in terms of the number of offspring of the individual as well as those of his/her kin members. Thus, an individual or a design could maximize its fitness by behaviors that promote its own fitness or by behaviors that promote the reproductive success of its genetic relatives. Refer to Hamilton (1964) and E. O. Wilson (1975) for a detailed account of the concept of inclusive fitness and its application in explaining various altruistic behaviors in animal and insect species. In spite of the fact that the ultimate goal of all psychological mechanisms is fitness maximization, it would be inappropriate to say that all individual behaviors should strive to achieve that goal. This is not the case, first because individuals are not conscious fitness maximizers, and second because any individual behavior is a result of an interaction between the environment and the underlying psychological mechanism dealing with that particular domain (Cosmides & Tooby, 1994a). Thus, any change in the environmen-

¹An adaptive problem is one that is said to have occurred often and for a long period of time in the evolutionary history of a species, and thus to have demanded a specific solution or design. For example, the adaptive problem of ensuring a high intake of nutritious food during the evolutionary period was solved by the mechanism for generating a sensation of sweetness or what is known as the phenomenon of a sweet tooth in humans. The resulting mechanism that solves an adaptive problem is called an adaptation.

²Fitness or reproductive success, as described here and by Darwin, is more appropriate to be measured at the gene level rather than at the individual level. As articulated by Dawkins (1976), in the natural struggle for survival, individuals are nothing but a vehicle for the genes to propagate themselves into future generations.

tal input could result in behaviors that are not adaptive, or sometimes even maladaptive. For example, the universal preference for sweet or fatty foods is an adaptive mechanism to the scarcity of food that was prevalent in the ancestral world. Clearly, in today's world of nonscarcity, the latter preference is maladaptive and hence leads to high rates of obesity. But this does not undermine the fact that the psychological mechanisms are adaptations designed to solve adaptive problems in specific domains. See Cosmides and Tooby (1994a) for an excellent argument on this issue.

The concept of inclusive fitness helped explain numerous altruistic behaviors that ran contrary to the promotion of an individual's own reproductive success or Darwinian fitness. However, it still could not account for altruistic behavior observed among individuals who were not genetically related to each other. In a seminal work addressing this issue, Trivers (1971) proposed the theory of reciprocal altruism, which could explain the cooperative behavior observed among unrelated individuals. Trivers (1971) presented a scientific argument as to how reciprocally cooperative or altruistic behavior could evolve among individuals if certain conditions are met in the environment. This theory also then resulted in the identification of associated psychological mechanisms that should help solve the adaptive problems associated with such a behavior (e.g., the mechanism for facial recognition among individuals, and the mechanism for recognizing cheaters in such social contracts). Cosmides and Tooby (1992) presented a series of experimental evidence to suggest the existence of such a cheater-detection mechanism, which only operates in the domain of social contracts. See Cosmides and Tooby (1992) for further explanation and evidence to this effect. Also see Smith (1982) and Axelrod and Hamilton (1981), for a game-theoretic account of how cooperation could evolve as a stable strategy among individuals of a particular species.

Another domain that has been extensively studied by evolutionary psychologists is that of mate selection and mating behaviors in humans. Through a series of cross-cultural studies, Buss (1989) established the universal differences in mate preferences between human males and females. He proposed and found that across cultures males tend to value physical attractiveness and youth in their mates, whereas females value financial prospects among their mates. Moreover, males are said to be keener on short-term mating than females. Symons (1979), in his seminal work on human sexuality, presented a series of anecdotal and historical evidence to the same effect. In a further extension to the above domain, M. Wilson and Daly (1992) identified the existence of a feeling of sexual proprietariness among males, which was identified as a cause for various aggressive and violent behaviors like family homicide, among humans (Daly & M. Wilson, 1988). Underlying some of these behaviors is the evolved, adaptive mechanism of male sexual jealousy. Jealousy is said to be typically sexual in males and emotional in females

(see M. Wilson & Daly, 1992). Evolutionary psychologists argue that because it is difficult for men to ensure paternal certainty, they have evolved the adaptive mechanism of severe sexual jealousy (cf. Buss, 1994). On the other hand, “environmentalists” (e.g., most sociologists and anthropologists) might suggest that because men have traditionally owned and controlled economic assets, they might feel unduly threatened when facing the possibility of losing one of their assets (i.e., women in this case). Note the difference in outlook between the two approaches: The evolutionary framework seeks to understand why a particular human universal has evolved, whereas the “environmental” paradigm views the world as consisting of socialization processes and learned behaviors, without explaining how these universal socialization processes came to exist. For a remarkable treatise on the difference between the two approaches, see Tooby and Cosmides (1992).

Other domains of human behavior that have been investigated through evolutionary psychology include that of emotions, facial expressions of emotions, environmental preferences, spatial abilities, universal grammar in languages, psychiatry, parent-offspring relationships, sibling rivalry, theories of personality, and memory systems. All the above domains have been associated with an underlying psychological mechanism that was selected for because it solved a particular adaptive problem, and as a result, produced adaptive behaviors in the evolutionary past. For example, Silverman and Eals (1992) present experimental evidence on the differences in spatial abilities among males and females. Specifically, they find that males are particularly good at space relations and mental rotations, whereas females are good at location and object memory. This is proposed to be a result of psychological mechanisms that evolved to solve adaptive problems that males faced while hunting and females while gathering for food in the evolutionary past. For further reading on the evolutionary mechanisms for language, environmental preferences, parental care, and intrapsychic processes see Barkow et al. (1992).

ADOPTION OF EVOLUTIONARY PSYCHOLOGY IN VARIOUS DISCIPLINES

Given the broad and all-encompassing theoretical propositions of evolutionary psychology, it is reasonable to expect that other disciplines investigating human behavior would have adopted it as an explanatory framework for their findings. The present section investigates this issue and looks at the growth, across disciplines, in the number of articles that used evolutionary psychology as an explanatory framework. The aim of the present exercise is to demonstrate the growing acceptance of this framework in various disciplines and thus present a case for its viability in the field of marketing.

In order to investigate the trend in the acceptance and use of the evolutionary psychology paradigm in other disciplines it was deemed appropriate to search for articles in databases that are dedicated to particular disciplines. The databases³ identified for the search covered most of the disciplines that investigated human behaviors in various contexts. Identification of appropriate search words was carried out by means of a brainstorming session among the authors to identify words that would capture the application of underlying principles of evolutionary psychology in a particular article. The brainstorming followed the technique prescribed by Osborn (1953) for two-person teams, namely, working together, and then alone, and then together again. The search words generated through the brainstorming exercise were *evolutionary psychology*, *sociobiology*, *psychological mechanisms*, *domain-specific mechanisms*, *domain-general mechanisms*, *Darwinian modules*, *Darwinism*, *behavior and evolution*, *Darwinian*, *evolutionary models*, *evolutionary theories*, *human universals*, and *human evolution*.

Subsequently, a list of words was selected that remained within the psychological domain of human behavior, as captured by the evolutionary framework. This led to the elimination of words for which the meanings were so broad that they captured all of evolutionary theory (e.g., *evolutionary models*, *evolutionary theories*, *evolution and behavior*, and *human evolution*) or were too general (e.g., *human universals* and *psychological mechanisms*) or too narrow in their scope (e.g., *domain-specific mechanisms*, *domain-general mechanisms*, and *Darwinian modules*). This exercise resulted in the selection of four search words that were sufficiently broad to capture the evolutionary framework within their definition and were specific enough to remain within the psychological or behavioral domain. These four words were *evolutionary psychology*, *sociobiology*,⁴ *Darwinism*, and *Darwinian*. The inclusion of both *Darwinism* and *Darwinian* was thought to be appropriate because the former referred to the general theoretical paradigm of evolutionary theory and the latter implied the application of this paradigm to a particular behavior or finding. Table 1 presents the tabulation of the number of articles appearing over the years under each search word within a particular database. The data for the total number of articles appearing within each of the search words are plotted in Figure 1. A visual inspection of Figure 1 reveals that the number of articles that were using

³These databases are not mutually exclusive and many citations appear in more than one database.

But such double counting should not affect the trend analysis, as it would be reflected, more or less, equally over the years. The alternative way of controlling for these double counting of citations would have been too cumbersome, and probably not changed much of the results in the present context.

⁴*Sociobiology* is a term coined by E. O. Wilson (1975) in his seminal work on explaining the social behavior among insects and animals, including humans, from an evolutionary perspective. Note that sociobiology tries to explain social behaviors from a biological perspective, whereas evolutionary psychology aims at identifying the underlying evolved psychological mechanisms that produce this behavior.

Table 1. Number of Articles Related to Evolutionary Psychology as Indexed in Various Databases.

Search Word and Database	Years						
	65–69	70–74	75–79	80–84	85–89	90–94	95–99
Evolutionary Psychology							
Sociofile		1	0	0	3	11	20
Soc. Science Abstracts				0	0	12	32
Humanities				0	0	0	8
PsychInfo	0	0	1	4	8	42	175
EconLit		0	0	0	0	1	7
Medline	0	0	1	1	0	0	24
Applied Sci. & Tech.				0	0	0	4
ABI-Inform					0	1	14
Total	0	1	2	5	11	67	284
Sociobiology							
Sociofile		0	113	237	177	123	183
Soc. Science Abstracts				32	64	90	76
Humanities				14	14	7	40
PsychInfo	3	2	43	127	212	170	142
EconLit		0	7	6	5	8	9
Medline	2	1	13	21	23	8	13
Applied Sci. & Tech.				14	14	7	30
ABI-Inform					2	3	5
Total	5	3	176	451	511	416	498
Darwinism							
Sociofile		16	55	76	62	84	125
Soc. Science Abstracts				3	14	21	44
Humanities				9	17	40	88
PsychInfo	2	15	15	51	72	107	118
EconLit		1	0	3	2	10	4
Medline	3	3	9	12	17	21	22
Applied Sci. & Tech.				6	10	9	7
ABI-Inform					8	12	30
Total	5	35	79	160	202	304	438
Darwinian							
Sociofile		13	43	31	68	38	63
Soc. Science Abstracts				1	25	23	59
Humanities				5	5	18	97
PsychInfo	3	13	16	33	56	83	132
EconLit				0	4	20	28
Medline	14	17	22	39	62	76	124
Applied Sci. & Tech.				3	7	8	25
ABI-Inform					17	24	75
Total	17	43	81	112	244	290	603

evolutionary psychology, *Darwinism* or *Darwinian* as a word in their abstract have been steadily increasing in all of the databases over the years. This is also evident from the exponential growth trend line fitting the data for *evolutionary psychology* and *Darwinian*, and the quadratic growth trend line fitting the data for *Darwinism* (refer to Table 2 for

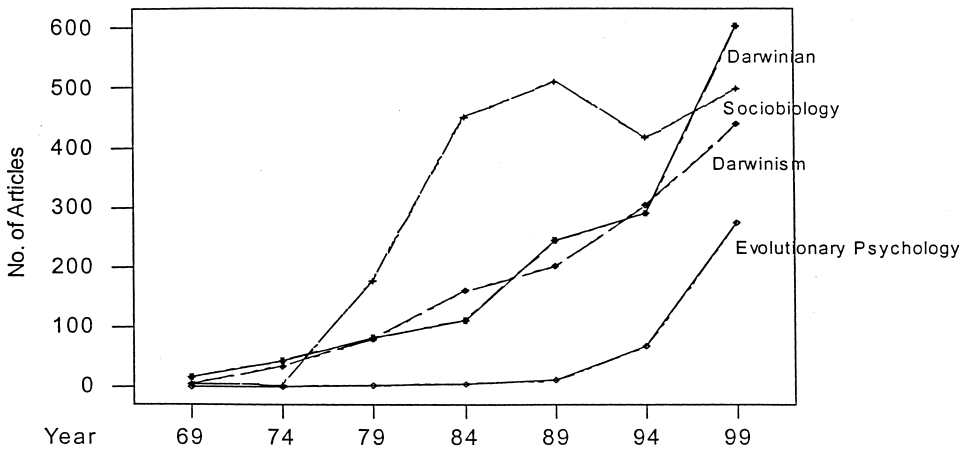


Figure 1. Trend in total number of articles appearing in the last 30 years (1969–1999) within each search word.

details). The use of *sociobiology* appears to have decreased after peaking in the period of 1985–1989, as is evident from Figure 1 and the quadratic, inverted-U–shaped trend line fitting the corresponding data (refer to Table 2). This may be because *sociobiology* was a term coined to explain social behaviors in the case of insects and animals, and it tended to concentrate more on the social phenomena rather than the underlying mechanism. The area of evolutionary psychology has been more spe-

Table 2. Trend Analysis for the Total Number of Articles Appearing within Each of the Search Words in the Last 30 Years (1969–99)

Search Word	Trend	Nature of Trend	Model ^a
Evolutionary psychology	Exponential growth	Increasing	$0.070*(3.10^t)$
Sociobiology	Quadratic	Inverted-U	$-275.71 + 222.86*t - 16.07*t^2$
Darwinism	Quadratic	Increasing	$-0.71 + 0.29*t + 8.71_a*t^2$
Darwinian	Exponential growth	Increasing	$12.45a*(1.75^t)$

Note: Following a visual inspection of the data, three functional forms were chosen for growth-trend modeling, namely, linear, quadratic, and exponential functions. The modeling was conducted for each of the four search words. The best-fitting models reported here were selected based on a minimization of MAPE (mean absolute percentage error) and MAD (mean absolute deviation). All chosen models, except the one for *sociobiology*, were consistent in terms of yielding the lowest value for both MAPE and MAD. In the latter case there was an inconsistency; namely, the linear model yielded the lowest MAPE, whereas the quadratic model yielded the lowest MAD. This inconsistency was resolved by visual inspection of the data, which suggested that a quadratic, inverted-U–shaped model might be superior to a linear one.

^aThe statistical software used for the aforementioned trend modeling does not report the significance value of the estimated coefficients. Thus, another statistical package was used to perform the appropriate nonlinear regressions in order to obtain the statistical significance of the estimated coefficients. Given that two separate procedures were used, the estimated coefficients were slightly different across the two statistical packages. All coefficients with a subscript are significant at $p < .05$.

cific about its psychological underpinnings and has thus found an increasing acceptance in the social sciences. It is worth noting that the field of management has begun to use this framework in recent years, as is evident from the number of articles appearing in the database ABI-Inform (a database specific to the management discipline). Thus, the above trend analysis illustrates the argument made in favor of the acceptance of evolutionary psychology framework.⁵

Evolutionary Psychology in the Management and Marketing Literature

As the above investigation suggests, the value of evolutionary psychology as an explanatory framework to human behavior is being increasingly recognized and incorporated into various disciplines. The numbers in Table 1 reflect an increasing number of articles in social science disciplines that have specifically used evolutionary psychology as a framework to explain their findings. Even the field of management has adopted this framework lately (14 articles appeared in the period 1995–1999 as per an ABI-Inform search on *evolutionary psychology*). Nicholson (1998) has made reference to this framework and its potential applications in understanding individual behavior within organizations. In the context of organizations, evolutionary psychology has also been employed in investigating sexual harassment within organizations (Studd & Gattiker, 1991), and to understand organizational structures (Pierce & White, 1999). But to the authors' best knowledge, no one except Lynn, Kampschroeder, and Perriera (1998) has explicitly proposed the potential applications of evolutionary psychology to marketing and consumer behavior. Specifically, in one of their suggested applications of the paradigm, they trace the changes in the facial features of stuffed toys and find that these features have become increasingly similar to the neonatal features of human infants. This is linked to the evolved positive and endearing feelings generated by these features and hence the preferences among consumers for stuffed toys having such features.

⁵This trend analysis was also followed up by a detailed coding, according to discipline, of the articles appearing in the journal *Ethology and Sociobiology* (called *Evolution and Human Behavior* from 1997 onwards), which is dedicated to publishing articles dealing with evolutionary explanations of human behavior. The coding of the articles was done based on the departmental affiliation of the authors rather than on the content of the articles to avoid any conflict or ambiguities about the correct classification of the contents into disciplines. It was found that most of the articles tended to originate from authors of psychological and social-science based disciplines (344 articles out of a total of 504 articles). A smaller number came from biological and medical disciplines (127 articles). The journal seems to have maintained a reasonably consistent and equal share of articles from both psychological and social science disciplines (191 and 153 articles, respectively). This tends to imply the use of evolutionary psychology by authors from both these types of disciplines. The appearance of a few articles in recent years from authors in management and economics (two and four articles, respectively) is also worth noting given the present context.

In another application they link the evolved human preferences for savanna⁶ like landscapes to the consumer preferences and positive affective responses toward resorts and hotels having such features. Similarly, they link the preference among consumers toward places of residence to the habitat-preference mechanisms in humans as specified by the prospect-refuge theory.⁷

APPLYING EVOLUTIONARY PSYCHOLOGY TO MARKETING

Given the increasing acceptance of evolutionary psychology in the scientific community, Bagozzi and Natarajan (2000) espouse a need for creative research applying this framework to marketing. In light of their suggestion and the lack of such research in the marketing literature, a potentially fruitful opportunity is foreseen in the application of this new paradigm to marketing. As a first step in applying this framework to marketing, the effect of gender on various consumption-related behaviors is investigated. This is because sex differences have been extensively studied under the evolutionary framework and the role of gender as a moderator variable has been of much importance in marketing studies. However, these marketing studies have predominantly used the *socialization process* or *social role theory* framework in investigating the effect of gender. The next section first compares the above two paradigms in explaining gender-related behaviors, and argues for the superiority of the evolutionary framework. Subsequently, specific applications of the evolutionary framework are presented for explaining gender differences in consumption-related behavior.

Gender Differences in Behavior—Socialization vs. Evolutionary Predictions

The socialization model is one of the major processes identified by social role theory to account for gender differences in social behavior (Archer, 1996). This model proposes that men and women are differentially socialized to play different roles in society, based on the historical division of labor among women and men into homemakers and full-time paid

⁶Savanna-type landscapes are associated with scattered trees and wide-open grasslands, which provided nutritious food that was easy to obtain, protection from sun and predators, and long unimpeded views. These landscapes are typical of tropical Africa, the presumed site of human origins (Orians & Heerwagen, 1992).

⁷Prospect-refuge theory posits that “people prefer places and environments that allow opportunities to see without being seen” (Orians & Heerwagen, 1992, p. 571). *Prospect* refers to the ability to have multiple view opportunities and multiple opportunities to move through space to encourage environmental scanning and escape. *Refuge* refers to spaces with overhead protection and privacy that provides protection from predators and potential environmental hazards.

employees, respectively. Thus, it is proposed that the early socialization of men and women into these roles leads them to acquire agentic (assertive and instrumental) and communal (nurturance and yielding) traits, respectively. In addition, the early socialization of boys to be more aggressive and self-reliant, and that of girls to be more responsible, obedient, and sexually restrained, is said to result in their different dispositions and behaviors. These two propositions taken together have been the primary explanations used by researchers in marketing and other disciplines to account for gender-related differences in various contexts. Archer (1996) in a recent review and comparison between social role theory and evolutionary psychology concluded that the latter accounts much better for the overall pattern and origin of sex differences in social behavior. Presented below are some of the main arguments against social role theory, and in favor of evolutionary psychology, as an explanation for human sex differences.

1. Social role theory is imprecise and obscure about the agent of causality with regard to the different roles assigned to men and women (Buss, 1996). In contrast, evolutionary psychology is clear about the causal agent for these distinct roles and dispositions, namely, the recurrent and distinct adaptive problems faced by males and females during the evolutionary past.
2. Social role theory assumes that individuals are passive receptacles of whatever roles they are assigned (Buss, 1996). As per the evolutionary perspective, the selection of a passive receptacle, given the selection pressures and adaptive problems faced by humans, is highly unlikely (Tooby & Cosmides, 1992).
3. Social role theory cannot account for the observed consistency in gender socialization patterns across cultures. In contrast, evolutionary psychology posits that gender socialization plays an important role in maintaining social behavior that is consistent with the fitness interests of men and women (Archer, 1996; Buss, 1996).

The above account provides strong rationale for the viability of evolutionary theories as opposed to social role theory in investigating and discovering sex differences in social behavior. Thus, the ensuing sections will adopt evolutionary psychology as the primary explanatory framework, and will present and test for some specific evolutionary predictions regarding gender differences in behaviors in the consumption context.

EVOLUTIONARY EXPLANATIONS FOR GENDER DIFFERENCES IN CONSUMPTION

Gender differences have been studied quite extensively in the context of consumption-related behavior and cognition. Some of the areas of

investigation⁸ have been the effect of gender on message processing strategies (e.g., Darley & Smith, 1995; Meyers-Levy & Maheshwaran, 1991); gender differences in attitude toward the use of sexual appeal in advertising (e.g., LaTour, 1990); gender differences for appearance-related attitudes and behaviors (e.g., Burton, Netemeyer, & Lichtenstein, 1994); and gender differences in gift-giving behavior (e.g., Belk & Coon, 1993; McGrath, 1995). In addition, other gender-related differences in behavior have been investigated in an organizational and economic context. Among these, the ones that could have direct implications for consumption-related behavior are the effect of gender on propensity toward risky behavior (Jianakoplos & Bernasek, 1998; Powell & Ansic, 1997) and gender differences in proclivity toward unethical behavior (Betz, O'Connell, & Shepard, 1989). A common feature of all these investigations, especially the ones in the consumption context, is the use of the socialization model to account for gender-related differences. As a comparison, we now present evolutionary-psychology-based explanations and predictions for the issues investigated in some of the above-mentioned studies. Evolutionary predictions are provided for each of these issues and are tested against the results obtained from the above-mentioned social-role-theory-based studies. Also, some market-level data are provided to further support the evolutionary predictions for gender differences in these consumption-related attitudes and behaviors.

Concern for Physical Attractiveness Among Women

Physical attractiveness has been found to be a dimension of utmost concern among women (Burton et al., 1994). Socialization and cultural pressures have been propounded as the key sources for this concern. As argued earlier, these agents of causality, namely, *culture* or *media*, are obscure in that they are themselves an abstraction of other possible agents (Buss, 1996). The evolutionary argument for distinct traits valued by human males and females, in their respective mates, provides a more scientific explanation for these agents. Buss (1989) collected data from 10,000 respondents across 37 cultures to determine the preferred characteristics of potential mates among men and women. Across all cultures, men invariably rated youth and looks as more important than did women, and in nearly all cultures women preferred men with higher earning capacity. In addition, women as compared to men rated ambition and industriousness higher as a preferred characteristic. Both these preferences are said to have maximized the Darwinian fitness (reproductive success) in the respective sex, and thus got selected for during the evolutionary past (Buss, 1989; Symons, 1979). Given these distinct preferences, men and women are predicted to be differentially

⁸Note that the studies cited in each of the above areas are not mutually exhaustive, but are representative of the first or most important investigations undertaken in these areas.

concerned about these traits in order to attract and retain mates (Buss, 1994). This predicts an enhanced striving in men for resource acquisition, and in women for maintenance of physical attractiveness and youth. How do these predictions fare in regard to consumption-related attitude and behavior? The findings of Burton et al. (1994) in the context of appearance-related attitude and behavior are entirely in accord with these predictions. Women consistently score higher than men on clothing concern, public body consciousness, dieting frequency, cosmetic surgery attitude, sunbathing frequency, tanning-salon usage, and restrictive dieting (refer to Table 3). The authors, however, use social role theory and different socialization/cultural pressures as an explanation. But as with other social-role-theory-based explanations, the origin of these cultural and media-based pressures are not mentioned. Interestingly, they mention that “despite women’s changing role in the workplace and associated gains in financial and social power, it appears that the normative concern for appearance remains unmitigated” (Burton et al., 1994, p. 70). This comes to them as a surprise given the counterbalancing effect that sociocultural forces should have on women’s dispositions, as per social role theory. However, it is no surprise in light of evolutionary predictions that concern for appearance is probably an innate disposition among women to increase their perceived mate value in the eyes of men. The cultural and media-based social forces only accentuate these dispositions.

Further support to these predictions is provided by the sales data of the U.S. cosmetics market as presented in Table 4. As is apparent, even on a conservative estimate that excludes the sales of skin care and body

Table 3. Means for Appearance-Related Attitudes and Behaviors across Gender

	Males ^a	Females ^b
Clothing concern	62.8 ^a	69.0 ^b
Public body consciousness	28.9 ^a	33.5 ^b
Dieting frequency	0.9 ^a	3.1 ^b
Cosmetic surgery attitude	1.7 ^a	2.6 ^b
Sunbathing frequency	8.1 ^a	18.9 ^b
Tanning salon usage	3.6 ^a	9.2 ^b
Eating attitude test	5.6 ^a	11.7 ^b
Restrictive dieting	3.2 ^a	8.1 ^b
Exercise time	5.0 ^a	2.9 ^b
Steroids attitude	2.1 ^a	1.1 ^b

Note: All numbers represent mean values on the relevant scales used for each of the measures. Means in the same row that do not share superscripts differ at $p < .05$. From “Gender differences for appearance-related attitudes and behaviors: Implications for consumer welfare,” by S. Burton, R. G. Netemeyer, and D. Lichtenstein, 1994, *Journal of Public Policy and Marketing*, 13(2), p. 71. © 1994 American Marketing Association. Reprinted with permission.

^a $n = 143$.

^b $n = 121$.

and bath products, women's cosmetics (48% of total sales) account for seven times more of the total sales than do men's cosmetics (7% of the total sales). Also presented in Table 4 are the statistics of the total number of cosmetic surgery procedures performed in the United States, as classified by gender. As is evident from these statistics, cosmetic surgery procedures are performed about four times as often on women than on men. Moreover, except for the case of hair transplantation, the number of procedures performed on women is significantly higher than the corresponding procedures performed on men in all categories. These data clearly support the hypothesis regarding the concern and striving for youth and physical attractiveness among women, as predicted by the evolutionary theories of mate selection criteria. Data in Table 4 also indicate a developing concern for youth and physical attractiveness among men. This is, however, not at discord with the evolutionary predictions, as it is highly likely that these men are among those who have already attained a reasonable status and earning potential in society. At this point, this is a proposition based on evolutionary predictions and needs to be empirically verified. But it does indicate the usefulness of evolutionary theories in not only explaining current data, but also in

Table 4. Cosmetic Surgery Procedures and Sales of Cosmetic Products in the United States

	Female	% Female	Male	% Male
Number of cosmetic surgery procedures^a				
Chemical peel	827,640	86.69	127,064	13.31
Sclerotherapy (Vein Surgery)	410,450	94.67	23,088	5.33
Breast surgery	105,237	89.66	12,142	10.34
Liposuction surgery	312,487	83.81	60,370	16.19
Hair transplant/restoration	16,964	8.08	192,999	91.92
Facial surgery	581,993	76.54	178,360	23.46
All other procedures	1,637,368	80.63	393,302	19.37
Total	3,892,139	79.77	987,325	20.23
	Total Sales^c		% of Sales	
Sales of cosmetic products^b				
Skin care ^d	5,060		28	
Color cosmetics ^e	5,352		30	
Women's fragrances ^f	3,209		18	
Body and bath ^g	3,025		17	
Men's products ^h	1,412		7	
Total	18,058		100	

^aFigures are for 1998. From American Academy of Cosmetic Surgeons (www.cosmeticsurgery.org).

^bFigures are for 1996. From Market View 2000 (www.CosmeticMarket.com).

^cAll sales figures are in \$ millions.

^dIncludes facial treatment and sun care.

^eIncludes face makeup, eye makeup, lip color, nail color, and other (applicators, organizers etc.).

^fIncludes perfumes, colognes, and fine fragrance ancillary products.

^gAll hand and body care and bath and shower products that are not extensions of fine fragrances.

^hIncludes fragrances and ancillary products, men's treatment.

arriving at new predictions that would not have been possible with the use of social role theory alone.

Striving for Financial Resources and Risk-Seeking among Men

Based on the findings of distinct mate preferences in humans (Buss, 1989), it was predicted that men would display an enhanced striving and motivation for acquiring resources and status. In the consumption context, this would translate into men having a greater risk propensity toward acquiring resources and status, just as women have toward maintaining youth and physical attractiveness. In that regard, Powel and Ansic (1997) show that females are less risk seeking than males in financial decision making, irrespective of the familiarity and framing of the decision. Also, using survey data, Jianakoplos and Bernasek (1998) find that single women exhibit relatively more risk aversion in financial decision making than do single men. Specifically, across similar economic status, single women hold a smaller proportion of their wealth in risky assets as compared to single men. Finally, in a study among business students, Betz et al. (1989) find that males were significantly more likely than females to engage in unethical behaviors to acquire additional financial benefits (refer to Table 5 for their findings). The authors, however, use the socialization model to explain these differences. But all of the above findings are completely in accord with the evolutionary predictions that propose an increased willingness in males to take risks, especially to acquire resources or gain status—a trait valued highly by females (Buss, 1989).

The enhanced striving for acquiring resources also manifests itself in males displaying a higher propensity to engage in intrasexual competition and aggression (Buss, 1996). This increased propensity of intrasexual competition for status among males and their increased levels of risk-seeking tendencies could also manifest itself in other consumption-related pursuits, like participation in competitive sports and risky lei-

Table 5. Percentages on Willingness to Engage in Unethical Behavior by Gender

	Males ^a	Females ^b
Willing to use shortcut estimating method	39.3	19.6
Claim \$50 extra on travel expenses	14.9	6.1
Willing to buy stock with inside information	50.0	31.3
Willing to transfer \$20,000 by computer from their employer	12.3	4.0
Willing to make \$100,000 from a marijuana deal	17.5	2.0

Note: All numbers represent percentages of males/females who said “yes” to the given question. From “Gender differences in proclivity for unethical behavior,” by M. Betz, L. O’Connell, and J. M. Shepard, 1989, *Journal of Business Ethics*, 8, p. 323. © 1989 Kluwer Publications. Reprinted with permission.

^a*n* = 114.

^b*n* = 99.

Table 6. Outdoor Leisure Activities and Sexual Activities on the Internet by Gender

	% Men	% Women
Outdoor leisure activities ^a		
Windsurfing	63	37
Canoeing	55	45
Power boating	60	40
Fishing	69	31
Hunting	79	21
Snowmobiling	63	37
Bicycle riding	52	48
Motorcycling	72	28
Roller blading	53	47
Snowboarding	67	33
Sexual activity on internet ^b		
Viewed sexually explicit material	86	14
Used chat rooms to interact and develop relationships	23	49
Favor visual erotica	50	23

^aFrom Print Measurement Bureau (PMB), Canada, 1999, Vol. 11.

^bData reports % of those who said “yes” to the given question as per activities over the past year. From “Sexuality on the internet: From sexual exploitation to pathological expression,” by A. Cooper, C. R. Scherer, S. C. Boies, and B. L. Gordon, 1999, *Professional Psychology—Research and Practice*, 30(2), 154–164.

sure activities. Table 6 presents a comparison of men and women in their involvement in various outdoor leisure activities. As observed from the data, a significantly higher number of men than women are involved in the riskier outdoor pursuits of windsurfing, power boating, hunting, snowmobiling, motorcycling, and snowboarding. These activities are not directly related to status gains, but they do require a higher risk-seeking predisposition, a direct correlate to potential status gains in males. Even though social role theory could account for these differences based on socialization patterns among boys to display assertiveness and toughness, the cross-cultural consistency of such patterns would require an evolutionary explanation.

Response to Sexual Stimuli in Advertising

Following Trivers’s (1972) analysis of differential parental investment in offspring, it was proposed that males would be keener in short-term mating than females (Symons, 1979). This proposition was subsequently verified by empirical data in terms of propensity toward short-term mating and actual number of partners among men and women (Buss & Schmitt, 1993). As a result of this keenness toward short-term mating, men were also said to have evolved an increasing tendency of arousal by the visual stimuli of the female body (Symons, 1979). This

tendency is observed across cultures and is amply evident in the male-dominated and flourishing business of pornography (Table 6 provides further evidence that this propensity toward short-term mating and preference for visual stimuli still holds in the context of modern, internet-based pornographic environments). A direct effect of these propositions on consumption-related cognition and attitude is the rampant use of sex appeal, especially female nudity, in advertising. Along these lines, LaTour (1990) provides evidence that men react significantly more positively than women to the use of female nudity in advertising. He found that both men and women experienced high levels of arousal in the nude ad condition, but the nature of this arousal was distinctly different. Men were energized by female nudity; but women experienced tension and fatigue when exposed to the same. Moreover, men had positive feelings associated with the nude model ad, whereas women's reactions were negative. The results of this study were explained purely based on the early socialization of women to maintain sexual restraint. But the author did not provide an explanation for the positive feelings and attitudes of men toward these ads. Clearly, a socialization model cannot explain these results by espousing that men are trained to do so, nor does the lack of any training to maintain sexual restraint provide explanations for the actual positive arousal and feelings expressed by men. In contrast, the evolutionary predictions regarding sex differences in mating strategies (Buss & Schmitt, 1993) would clearly account for these attitudes as well as the experienced physiological states of arousal and associated positive feelings. An account based on evolutionary psychology is evidently more cogent and scientifically valid. Of particular interest in this regard would be to test the evolutionary predictions with respect to female reactions to sexual stimuli. Symons (1979) posits that females are positively aroused by the depiction of the act of intimacy rather than by nudity of either sex. Thus, the presence of both male and female in an intimate posture is more pleasing to a woman than the presence of a male or female model alone. Symons (1979) documents anecdotal and experimental evidence in support of this claim. Testing these predictions in the context of the use of sex appeal in advertising targeted toward women would be a fruitful avenue of research. A socialization-based account for these predictions would be difficult, if not impossible, to construct.

Gender Differences in Gift-Giving Motivations

Gift giving is understood to be a universal phenomenon and has been studied in depth in anthropology, sociology, and consumer psychology. Within the evolutionary psychology framework, gift giving is a manifestation of reciprocal altruism as studied by Trivers (1971). Reciprocal

altruism is an adaptive mechanism that evolved as a result of the fitness benefits of food-sharing, coalition formation, and predator avoidance. In the context of gift giving in romantic relationships, the need for reciprocity is uniquely combined with the distinct mating strategies of men and women. The framework of sex differences in mating strategies (Buss & Schmitt, 1993; Symons, 1979; Trivers, 1972) has recently been applied by Saad and Gill (1999) to investigate gender differences in motivations for gift-giving in the context of a romantic relationship. The findings in this context were in accord with the evolutionary predictions. Specifically, men as compared to women were found to be more tactical and instrumental in their motives for giving gifts, as would be expected from their keenness for short-term mating. Men were found to be more likely than women to indicate the use of gifts as a signal to display resources, create a good impression, as a means of seduction, and to display long-term interest. Moreover, men and women did not differ in other situational motives, such as giving a gift for an occasion or to maintain reciprocity. These evolutionary-based predictions are also in accord with the past findings in marketing literature (e.g., Belk & Coon, 1993) that men view gift giving as more of an economic/social exchange as opposed to a pure expression of love or affection.

EVOLUTIONARY PSYCHOLOGY APPLIED TO OTHER CONSUMPTION-SPECIFIC PHENOMENA

In light of the above evidence and arguments, it can be proposed that evolutionary psychology is a viable, if not better, theoretical framework to use in investigating gender differences in consumption-related behavior. As argued earlier, evolutionary psychology tries to emphasize the ultimate rather than proximate explanations for human behavior. In the context of consumer behavior, the emphasis would be on explaining why a particular behavior is manifested in the marketplace, rather than emphasizing what the behaviors manifested in the marketplace are. Understanding the why of consumer behavior is important for completing the causal sequence from the proximate social science theories to the biologically based natural science theories. Evolutionary psychology provides this intermediate link of causation through the evolved psychological mechanisms embodied in the human mind. These mechanisms interact with the external environment created by marketers and influence consumer behavior as is observed in the marketplace. Based on this premise, the next few sections present other avenues of research where evolutionary psychology could be applied in investigating consumer behavior. The emphasis in the subsequent sections is on presenting new research ideas and explanations that would be obscured without the lens of evolutionary psychology.

Endorser Attractiveness—Media Driven or Innately Prespecified

The physical attractiveness of a celebrity endorser or a model is one of the factors that affect favorable attitude towards the product endorsed. Though there has not been much research in marketing to quantify this dimension, media influences are often specified as the underlying sources for developing a standard for physical attractiveness.⁹ It is proposed that people's standards for judging physical attractiveness of women are primarily derived through the endorser or model's physical attributes emphasized in the media. Thus these standards are malleable and can be easily modified through media influences. In contrast to these arguments, Singh (1993) proposed that there exists a universal standard with regard to judging physical attractiveness of women, and it is innately prespecified as opposed to being media driven. He conducted a study across several cultures, including tribal cultures in the Amazon, where there are no media influences, to identify and verify the existence of these universal standards for judging physical attractiveness. He found that waist-to-hip ratio was the most important dimension used by subjects to judge physical attractiveness of females. Across cultures, women with a waist-to-hip ratio of 0.7 were judged as the most physically appealing. This ratio is directly linked to the probability of reproductive success among women, in terms of giving birth to healthy offspring (Singh, 1993). Thus, even though media influences can alter the perceptions of attractiveness on the dimension of body weight (preferences for slim or full-bodied individuals), the underlying dimension of waist-to-hip ratio seems to be an innately prespecified constant. Along these lines, one would expect that even though perceptions of physical attractiveness of female models in advertising might have changed over the years in terms of their weight, they might have remained the same in terms of waist-to-hip ratios. A possible research methodology to test this prediction would be a content analysis of advertising found over the last 50 years that used female models for endorsing products. Also, in the context of current advertising, the waist-to-hip ratio of models may capture the underlying variance in the perceptions of physical attractiveness of these female models. This might be tested either with consumer subjects or with advertising agency executives who choose these models for a particular advertising campaign. Clearly, the above prediction can only be explained using the evolutionary framework, as it would be difficult to identify socialization processes that make individuals sensitive to waist-to-hip ratios.

⁹*Physical attractiveness* as used in the present context only refers to the bodily dimension of physical attractiveness of an individual. It does not capture the dimension of facial attractiveness, which incidentally, has also been investigated by evolutionary psychologists. See Grammer and Thornhill (1994) for a detailed study investigating the underlying dimensions of facial attractiveness. This study could also be applied to the context of endorser attractiveness, specifically in regard to studying facial attractiveness of endorsers or models.

Menstrual Cycle and Consumption Choices

Numerous researchers have investigated the relationship between where a woman is in her menstrual cycle and several specific behaviors. For example, Hill and Wenzl (1981; as cited in Wright, 1995) and Grammer, Dittami, and Fischmann (1993; also as cited in Wright, 1995) have shown that women going to singles bars dress more provocatively and wear more makeup and jewelry when close to ovulation. Baker (1996) discusses research wherein it was found that women were more likely to cheat around ovulation while also not insisting that the men use contraception. The evolutionary mechanisms governing these changes are said to be operative at the dispositional level, and may not always result in the specific behaviors espoused in the above studies. But these behaviors are certainly more likely to occur given the changes in the dispositions as a function of the stage in the menstrual cycle. Given these findings, might a woman's menstrual cycle be related to her consumption choices? Some specific research questions that could be investigated within this framework are: Is the purchase of certain items that affect a woman's inclusive fitness (e.g., purchase of lingerie) related to her menstrual cycle? Is engaging in certain consumption-related activities (e.g., going to a bar and accepting a blind date) related to a woman's menstrual cycle? As mentioned earlier, these changes in consumption-specific behaviors are not directly reducible to the evolutionary mechanisms governing them, but are a product of the evolutionary dispositions and the specific environmental context. Given a specific consumption context (e.g., shopping for clothes in a department store), the behavioral disposition determined by the stage in the menstrual cycle might promote the impulsive or planned buying of certain items (e.g., lingerie or provocative dresses) directly related to the probability of increased inclusive fitness. In a similar vein, these dispositions might promote a heightened attention to advertising and promotional cues related to these items. Note that all of these research questions can only be addressed within the evolutionary psychology framework, as any socialization effects in this regard would be difficult to imagine.

Consumer-Experienced Emotions and Facial Expressions

An evolutionary view of emotions has been proposed by Plutchik (1984) and Tooby and Cosmides (1990). According to this view, emotions are said to be functions of environmental factors and to act as precursors to adaptive behavior by the organism (Plutchik, 1984). For example, fear prepares an individual to engage in avoidance or flight behavior with respect to the stimulus that initiates the emotion, and anger is said to prepare individuals for aggression or fight behavior toward the initiating stimulus (Plutchik, 1984). These negative emotions both perform an adaptive function by initiating a response that would maximize fitness

in the given context.¹⁰ The adaptive significance of emotions is also consistent with the strategic interference view of negative emotions, which espouses that these emotions alert individuals to fitness-reducing events (Buss, 1996). In the marketing context, consumer-experienced emotions and their mediating role in affecting attitudes and behavior has been a significant area of research. One such research area is the effectiveness of fear appeals in bringing about change in attitudes and behavior toward potentially harmful consumption habits (e.g., smoking, drinking, etc.). One of the findings in this context is that moderate levels of fear and the associated arousal are the most effective, though this result has not been consistent across studies (cf. Henthorne, LaTour, & Nataraajan, 1993; LaTour, & Rotfeld, 1997). An evolutionary account of the latter finding would suggest that a low-fear level might not sufficiently draw an individual's attention to the problem at hand and would accordingly not prime the adaptive fight-or-flight Darwinian module. On the other hand, a high fear level might freeze the individual into inaction, like the proverbial deer frozen in fear when faced with oncoming car headlights. Thus the optimal fear level is a moderate one, for it draws the individual's attention to the stimulus while signaling that steps can still be taken to alleviate or solve the fitness-reducing problem. As per the evolutionary account of emotions, the effectiveness of fear appeals should be directly related to the fitness costs associated with the initiating stimulus. That is, stimuli that are associated with high fitness costs should generate more fear, and accordingly result in more significant changes in attitudes and behavior toward those stimuli. That being said, the precise fear-inducing message is likely prone to substantial gender differences. The fact that smoking cigarettes and sun tanning increase the incidence of wrinkles is likely to be a more efficacious fear appeal when targeting women is undoubtedly because it carries greater fitness costs to them than it does to men. Thus, not only can evolutionary psychology be used to explain the optimal fear level that should be cued in a fear appeal, but also it can be used to explain gender differences in terms of its specific contents.

A related evolutionary mechanism operative in the case of emotions is that of the facial expression of emotions. Ekman (1973), through a series of cross-cultural studies, established the existence of universal facial expressions that were associated with six basic emotions of anger, shock, happiness, disgust, sadness, and fear among humans. These uni-

¹⁰The role of emotions in decision making has been brought to the limelight by the experimental evidence that patients with brain damage to the area responsible for experiencing emotions are severely inhibited in simple decision-making tasks (Damasio, 1994). These and other findings have received considerable attention in the experimental economics and behavioral decision-making literature, and spurred much additional research in this direction. See Elster (1998) for a detailed review on the relevance of emotions to economic behavior. These findings further substantiate the evolutionary view of a strong relationship between emotive and cognitive centers of the brain and their adaptive link to behaviors.

versal expressions help signal the motives and feelings of individuals engaging in social exchanges with another individual. Complementary to the evolutionary mechanism of facial expression of emotions is the mechanism for decoding the emotions from the facial expressions. To the extent that it manifests itself in service encounters, one would expect that customers are innately equipped to detect fake from genuine smiles from the service provider. Thus the policy of greeting a customer with a smile, as espoused by various service organizations, including Wal-Mart, McDonald's, and various airlines, may not really be working if the smiles are seen as fake. In fact, they might even have a detrimental or no effect on the customer's perceived satisfaction with the service provider. Thus, an investigation of customer-perceived effect of *smile* on satisfaction with the service provider would be of much relevance to marketers. In this regard, it should be noted that gender might moderate the effect of *smile* on customer-perceived satisfaction with the provider. Specifically, males might react more favorably than females to smiles displayed by a female service provider. This is a direct prediction from evidence provided by Abbey (1982) that men often misinterpret a smile or friendliness from a woman as an indicator of sexual interest. This misinterpretation could also manifest itself in the context of other interpersonal encounters, especially during extended service transactions.

Consumption Decisions as Maximization of Inclusive Fitness Rather than Expected Utility

Cooper (1987) presents a compelling argument for the case that decision theory can be considered a branch of evolutionary theory. Specifically, he looks at the striking similarity between the concept of utility maximization in decision theory and that of fitness maximization in evolutionary theory. Further, through a series of propositions and proofs, he demonstrates the reducibility of basic Savage axioms of decision theory to the biological underpinnings of inclusive fitness maximization. Similarly, Gigerenzer (1996) and Cosmides and Tooby (1994b) argue that rational behavior as proposed by decision theorists and economists is rational only to the extent that it is adaptive and promotes inclusive fitness of the individual. These arguments are substantiated by experimental evidence that suggests that humans actually behave adaptively rather than rationally as presupposed by the utility maximization paradigms. Furthermore, Gigerenzer and Goldstein (1996) demonstrate that humans are boundedly rational and that the mind uses simple, fast, and frugal satisficing algorithms rather than complex and costly (in the sense of mental capacity required) utility maximization algorithms, to solve complex problems in nature.

The argument for decision theory as a branch of evolutionary theory could be extended to understanding consumer decision making for cer-

tain purchases. This approach provides a new basis for defining rationality in terms of inclusive fitness rather than utility maximization. Thus, for example, consumer choices of fashion products, especially among women, are known to be driven by a motive to look attractive or desirable as a mate or high in fitness value in the evolutionary psychology terminology. Similarly, most conspicuous consumption (e.g., fancy sports cars, expensive watches, palatial houses, etc.) can be considered a signaling of financial resources. This is clearly linked to increased status and thus higher inclusive fitness for men. Hence, even though the decision rules used by consumers at the proximate or conscious level tend to maximize the utility in a cost–benefit sense, the underlying motives for the purchase might still be driven by fitness maximization rules at the subconscious level. *Rationality*, as understood by economists as utility maximization and by consumer psychologists as need-based value maximization could be linked to the underlying biological construct of inclusive fitness. This would help attain consistency across various disciplines studying consumer behavior and would also result in these disciplines being integrated with the natural sciences that espouse a biological basis for human nature.

Other Potential Areas of Application

Having proposed some specific applications of evolutionary psychology to consumption-related behavior, the present section discusses other potential research avenues along these lines. The applications presented here are more on the speculative side and do not offer direct evidence based on evolutionary theories. However, they provide research avenues that could help establish such links.

Sulloway (1996) proposed that birth order (position of an individual amongst the siblings in a family) might exert a strong influence on personality and attitudes through the evolutionary psychology of niche picking. That is, the environmental factor of birth order influences the way the underlying genes express themselves in the development of personality (E. O. Wilson, 1998). Sulloway (1996) found that among all the variables of the five-factor model of personality, birth order correlated very highly with openness to experience, which made later-born persons more receptive to revolutionary new ideas. He supports this contention by his finding that, historically, later borns have been more receptive to such ideas (e.g., in science). In a study looking at 28 revolutionary ideas in science (e.g., Newton's gravitation theory, Darwin's theory of evolution, etc.), he found that the later borns were twice as likely than firstborns to be receptive to adopting these theories. Can the effect of birth order on this personality trait be extended to consumption-related attitudes and behaviors? A possible extension could be to the context of new product innovations. It might be that later borns are much more likely than firstborns to be receptive to radically new inno-

vations (discontinuous innovations) in the marketplace. This might lead them to adopt these radically new products or technologies much faster than firstborns. The implications for understanding new-product diffusion processes is that later borns are likely to be the majority of the innovators as classified by traditional marketing texts. If marketers can find a way of targeting and identifying these later borns on a differential basis, it would be of much significance, especially in the context of one-to-one relationship marketing. It would also be of much theoretical interest to verify the effect of birth order on responses to scales developed for measuring innovativeness and propensity to adopt radically new products. As noted earlier, these predictions are speculative in nature and await an empirical verification in their support.

Marketing scholars have readily accepted the value of cross-cultural studies in explaining variations in consumer purchase behavior across the world. These studies have presumed the socialization model as an explanation for these cultural differences. This line of reasoning has helped marketing scholars in identifying and accounting for various cross-cultural differences in consumer behaviors, attitudes, and choices related to goods and services. Given the fruitful research endeavors in this regard, marketing scholars have often ignored and shunned the idea of identifying and accounting for cross-cultural similarities in consumer-level behaviors. In fact, finding no differences in behaviors of consumers across cultures is often considered a null effect not worthy of explanation or further exploration. Evolutionary psychology is a valid framework to explain these findings that reflect cross-cultural similarity in preferences and behaviors. Moreover, understanding the theoretical reasoning behind such universal or innate preferences can aid marketers in dealing with consumers in the context of the modern global markets. As an illustration of this argument, it is noteworthy to mention the recent findings of Chattopadhyay, Gorn, and Darke (1998) in the context of color preferences across cultures. They found that consumers tend to have uniform color preferences across cultures. These universal preferences are such that blue is the most preferred color across cultures and yellow is the least preferred. This universal preference for blue is possibly linked to the color of sky and water—dominant parts of our evolutionary past. These preferences for colors can, however, change with occasions that are associated with specific norms in particular cultures (e.g., the preference for red on Valentine's Day and green on St. Patrick's Day). These findings are of much value to modern-day ad-copy designers, who, because of the increasing trend toward global brands, have to design ads and brand logos that have universal appeal. This study also provides a unique instance of how cross-cultural similarities and differences can be explained on both evolutionary and sociological grounds. Evolutionary psychology provides a theoretical basis for finding many other such instances of universal preferences and their possible modifications by cultural norms. As per the evolutionary frame-

work, *culture* itself is a product of the human mind and not vice versa, as proposed by the traditional social science model. Tooby and Cosmides (1992) argue that within-group similarities and across-group differences, termed *evoked culture*, are a result of the different evolved psychological mechanisms triggered by the local circumstances. Moreover, as per the theory of gene–culture co-evolution, the parts of evoked culture that are absorbed by individuals, and thus spread from one generation to another, are not arbitrary but constrained by epigenetic rules (E. O. Wilson, 1998). Identifying these underlying rules for specific cultural norms and their associated consumption phenomena would be of much relevance to marketers.

CONCLUSIONS

Evolutionary psychology proposes that the human mind is a product of evolution by natural selection. Moreover, it is composed of functional and domain-specific psychological mechanisms or modules that are geared toward guiding human behavior in these distinct domains. Embodied in these mechanisms are innate dispositions, preferences, and tendencies that would have maximized the inclusive fitness of the individuals possessing them. Thus, through the process of natural selection, these mechanisms and associated dispositions got fixed in human minds, and guide human behavior in the current context. Starting with this basic premise, the present article attempts to make an argument that evolutionary psychology is a valid and scientifically cogent framework to use in studying human behavior in the context of marketing. This argument was developed in three sections.

The first section introduced the main theories and propositions of the framework and substantiated them through valid scientific arguments. The second section looked at the growth of this framework in other disciplines of social and natural sciences. A growing trend is discovered in all the disciplines, including organizational studies and other social sciences. This growing trend in the application of evolutionary psychology is an indication of its increasing acceptance in the social science community. There is, however, a virtual absence of its application in marketing. Taking this as an opportunity, the third section presented some specific applications of evolutionary psychology in the context of marketing and consumer behavior.

As demonstrated in these applications, marketing can gain from evolutionary psychology in three distinct ways.

1. The evolutionary framework can be used to explain the findings that have already been documented in the current literature of marketing.

2. It can be used to explain the currently observed market-level phenomena.
3. It can be used to generate new hypotheses that predict consumption-related phenomena that are a result of the interaction between the marketing environment and the identified evolutionary psychological mechanisms.

Evolutionary psychology has all the qualities of good science, as espoused by E. O. Wilson (1998), namely, parsimony (it can predict a slew of behaviors by the concept of inclusive fitness alone), generality (it covers a range of phenomena across different contexts of human behavior), consilience (it is consistent with existing knowledge in biology and cognitive psychology), and predictiveness (its predictions are verifiable through observation and experimentation). In contrast, the current theories in social science predict human behavior in highly specific contexts, are based on myriad assumptions, and are often not consistent with each other. For example, consumer behavior as studied by economists and by consumer psychologists is based on different premises that often result in discordant predictions. Evolutionary psychology, on the other hand, seeks to achieve convergence rather than divergence across disciplines. In the context of consumer behavior, evolutionary psychology can link the proximate explanations of culture, socialization processes, and utility/value maximization with their ultimate biological underpinnings, namely, epigenetic rules, evolved psychological mechanisms and inclusive fitness, respectively. Thus, it is hoped that the present endeavor would stimulate some interest in marketing scholars to adopt the framework of evolutionary psychology in pursuing research in their respective domains. It would be a positive step in the direction of achieving fluency across the boundaries of natural and social sciences, as advocated by E. O. Wilson (1998) in the opening quote.

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